



## Ernst Florens Friedrich Chladni (1756 – 1827) Chladni vibration modes of guitar plate

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[http://en.wikipedia.org/wiki/Ernst\\_Chladni](http://en.wikipedia.org/wiki/Ernst_Chladni)

Ernst Florens Friedrich Chladni was a German physicist and musician. His important works include research on vibrating plates and the calculation of the speed of sound for different gases. For this some call him the "Father of Acoustics". He also did pioneering work in the study of meteorites, and therefore is regarded by some as the "Father of Meteoritics" as well.

### Personal life:

Although Chladni was born in Wittenberg, Germany, Chladni's family was from Kremnica, a mining town now in central Slovakia, then part of the Kingdom of Hungary. This has led to Chladni as being identified in the literature as German, Hungarian and Slovak. Martin Chladni, Ernst Chladni's grandfather

Chladni came from an educated family of academics and learned men. Chladni's great-grandfather, Georg Chladni (1637–92), a Lutheran clergyman, had to flee Kremnica on October 19, 1673 during the Counter Reformation. Chladni's grandfather, Martin Chladni (1669–1725), was also a Lutheran theologian, and in 1710 became professor of theology at the University of Wittenberg, and from 1720-1721 was dean of the faculty of theology and later rector of the university. Chladni's uncle, Justus Georg Chladni (1701–1765), was a law

professor at University of Wittenberg. Another uncle, Johann Martin Chladni (1710–1759), was a theologian and historian, and professor at the University of Erlangen and the University of Leipzig. Chladni's father, Ernst Martin Chladni (1715–1782), was a law professor and rector of the University of Wittenberg, where he joined the law faculty in 1746.[citation needed] Chladni's father disapproved of his son's interest in science and insisted that Chladni become a lawyer.

Chladni studied law and philosophy in Wittenberg and Leipzig, and obtained a law degree in 1782 from the University of Leipzig. When his father died in 1782, Chladni began his research in physics in earnest.

Chladni died in 1827 in Breslau, Lower Silesia, an area that is now in southwestern Poland. When Chladni died, this town was part of the Kingdom of Prussia, which was a member of the German Confederation.

One of Chladni's best-known achievements was inventing a technique to show the various modes of vibration on a mechanical surface. Chladni repeated the pioneering experiments of Robert Hooke of Oxford University who, on July 8, 1680, had observed the nodal patterns associated with the vibrations of glass plates. Hooke ran a bow along the edge of a plate covered with flour, and saw the nodal patterns emerge.

Chladni's technique, first published in 1787 in his book, *Entdeckungen über die Theorie des Klanges* ("Discoveries in the Theory of Sound"), consisted of drawing a bow over a piece of metal whose surface was lightly covered with sand. The plate was bowed until it reached resonance and the sand formed a pattern showing the nodal regions. Since the 20th century it has become more common to place a loudspeaker driven by an electronic signal generator over or under the plate to achieve a more accurate adjustable frequency.

Variations of this technique are commonly used in the design and construction of acoustic instruments such as violins, guitars, and cellos.



Chladni plate vibration mode 1



Chladni plate vibration mode 2